

NOMENCLATURAL NOTES ON THE SHORE FISHES OF BERMUDA¹

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AND

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(Fig. 38)

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INTRODUCTION

While preparing a Field Book of the Shore Fishes of Bermuda² it became evident that a number of changes would have to be made in the list of species as recorded in the literature of Bermuda. As it is undesirable to include the discussions involving these species in the Field Book, the following pages summarize the changes suggested and made by us. These alterations, such as the elimination of species based upon questionable records, synonymizing of species by reason of new knowledge of their life histories and color phases, corrections of misidentifications, etc., are the result of four seasons' work in the field at Bermuda. This has been carried on in the course of the Oceanographic Expeditions of the Department of Tropical Research of the New York Zoological Society, at Nonsuch and at the Biological Station for Research. This field work has been coupled with the examination and comparison of Bermuda and West Indian materials, types and otherwise, in our own collections, in the Field Museum at Chicago, the Museum of Comparative Zoology at Cambridge, the United States National Museum at Washington and the American Museum at New York.

No attempt has been made at complete synonymy, but only pertinent Bermuda references are included.

Family CLUPEIDAE

Sardinella anchovia Cuvier and Valenciennes

Sardinella anchovia Cuvier and Valenciennes.

Sardinella anchovia Cuvier and Valenciennes, *Hist. Nat. Poiss.*, XX, 1847, p. 269. Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 34.

Sardinella pinnula Bean, *Proc. Biol. Soc. Wash.*, XXV, 1912, p. 122.

The types of *pinnula* in the U. S. Nat. Mus., the Bermuda specimens that Bean recorded as *anchovia*, a number of Bermuda specimens taken by us, and a specimen of *anchovia* from Long Island have been examined by us. We can find no reason for not calling them all *anchovia*.

In the revision of *Sardinella* by Regan (1917), *pinnula*, described in 1912, was overlooked, but a specimen of *aurita*, under which *anchovia* was synonymized, was recorded from Bermuda. All of the Bermuda specimens agree with each other and disagree with Regan's definition in lacking a black opercular spot, which seems to be the only character separating *pinnula* from *anchovia*. However, in this connection it is of interest to note that in the Long Island

² FIELD BOOK OF THE SHORE FISHES OF BERMUDA, by William Beebe and John Tee-Van, published under the auspices of the New York Zoological Society by G. P. Putnam's Sons, 1933.

specimen and in some of our Bermuda fish, there is an appearance of a dusky spot caused by the dark gill cavity being viewed through a small transparent portion of the opercle. In the figure given by Cuvier and Valenciennes of *aurita* there is no dark opercular spot, although the dark projecting gill-filaments might be mistaken for one. The latter authors expressly state that there is a black opercular spot in *anchovia* and *aurita*.

Harengula macrophthalmus (Ranzani)

Harengula macrophthalmus (Ranzani).

Clupea macrophthalmus Ranzani, *Nov. Comm. Acad. Sci. Bonon.*, V, 1842, p. 320.

Sardinella macrophthalmus Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, 1906, p. 34.

Harengula maculosa (not of Cuvier and Valenciennes) Regan, *Ann. Mag. Nat. Hist.*, (8) XIX, 377-395.

We prefer the treatment accorded to the genus *Harengula* by American authors, as opposed to Regan's revision of the group. Accordingly we retain *sardina* as a valid species, and the Bermuda specimen assigned to *maculosa* by Regan is placed under *macrophthalmus*.

Family DUSSUMIERIIDAE

Jenkinsia lamprotaenia (Gosse)

Jenkinsia lamprotaenia (Gosse).

Clupea lamprotaenia Gosse, *Nat. Sojourn in Jamaica*, 1851, p. 291, pl. 1, fig. 2.

Dussumieria stolidifera Jordan and Gilbert, *Proc. U. S. Nat. Mus.*, VII, 1884, p. 25.

Stolephorus viridis Bean, *Proc. Biol. Soc. Wash.*, XXV, 1912, p. 122.

Jenkinsia lamprotaenia, Beebe and Tee-Van, *Zoologica*, Vol. X, No. 1, 1928, p. 43.

The types of *Stolephorus viridis* Bean were examined, and as already stated by Nichols, they are *Jenkinsia lamprotaenia*.

Jenkinsia stolidifera has also been placed under the synonymy of this species by the present authors (l. c.).

Family ENGRAULIDAE

Anchoviella choerostoma (Goode)

Anchoviella choerostoma (Goode).

Engraulis choerostoma Goode, *Amer. Journ. Sci. Arts*, Aug. 1874, p. 125.

Anchoviella choerostoma var. *atlantica* Borodin, *Bull. Vand. Oceano. Mus.*, I, Art. 1, 1928, p. 7.

The characters upon which the variety *atlantica* were established are certainly not valid. In the account of *choerostoma* given by Jordan and Seale

in their "Review of the Engraulidae" (Bull. Mus. Comp. Zool. Cambridge, LXVIII, No. 11, p. 404) the range of variation easily includes the characters of *atlantica*. In addition Borodin assumed that *choerostoma* was from the Pacific and that it had not been reported from Atlantic Panama. The species was originally described from Bermuda and has since been reported from various West Indian islands as well as from the Atlantic coast of Panama.

Family OPHICHTHYIDAE

Ophichthus havannensis (Bloch and Schneider)

Ophichthus havannensis (Bloch and Schneider).

Muraena havannensis Bloch and Schneider, *Syst. Ichth.*, 1801, p. 491.

Ophichthus triserialis (not of Kaup) Goode, *Am. Journ. Sci. Arts.*, XIV, Oct., 1877, p. 293; Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, 1906, p. 31.

The Bermuda specimen upon which Goode's record was based, has been examined by us. We see no reason for referring it to the Pacific coast form as opposed to the Atlantic geminate species, and the specimen agrees well with the descriptions of *Ophichthus havannensis* as viewed in the light of recent knowledge of the species. The older descriptions specify uniserial teeth in the lower jaw for *havannensis* and biserial for *triserialis*. West Indian material, however, represented by Metzelaar's (1919) Curacao specimen, shows a slight overlapping of teeth anteriorly, so that for a short space there is a double row of teeth in the lower jaw. This condition is also found in Goode's Bermuda specimen. Goode evidently adhered strictly to the then existing definitions, resulting in the assignment of the Bermuda fish to a Pacific form.

Sphagebranchus ophioneus Evermann and Marsh

Sphagebranchus ophioneus Evermann and Marsh 1900.

Sphagebranchus ophioneus Evermann and Marsh, *Bull. U. S. Fish Comm.*, XX, 1900, p. 73, fig. 7.

Sphagebranchus anguiformis (not of Peters), Barbour, *Bull. Mus. Comp. Zool.*, XLVI, No. 7, 1905, p. 112.

The young specimen (107 mm.) listed under *anguiformis* by Barbour has been examined. From its proportions (Head 11.2 in length, 3.2 in trunk; head and trunk 2.75 in length) and other characters, it is closer to *S. ophioneus* than to *anguiformis*, and as we have taken a much larger specimen of the former, it is undoubtedly that species. There is a note by Seale in the bottle containing the Barbour specimen, listing his disagreements with the identification.

Family MURAENIDAE

Enchelycore brunneus (Nichols)

Enchelycore brunneus (Nichols).

Gymnothorax brunneus Nichols, *Proc. Biol. Soc. Wash.*, XXXIII, 1920, p. 59.

Examination of the type of this species shows that it belongs to the genus *Enchelycore*, as it possesses the slit-like posterior nostril of that genus. It is probable that this species will later be shown to be the same as *Enchelycore nigrocastaneus* Cope, but we have had no material with which to compare the two forms.

The name *Gymnothorax brunneus* was also employed by Herre in 1923 for a Philippine eel (Philippine Journ. Sci., Manilla, P. I., 23, 1923, p. 212, fig. 13). We take pleasure in renaming the latter form **Gymnothorax herrei**.

Gymnothorax ocellatus Agassiz

Gymnothorax ocellatus Agassiz.

Gymnothorax ocellatus Agassiz, in Spix, *Pisc. Brasil.*, 1828, p. 91, pl. 50b.

?*Lycodontis jordani*, Evermann and Marsh, *Bull. U. S. Fish. Comm.*, XX, 1900, (1902), pt. 1, p. 78, pl. 2; Bean, *Field Col. Mus., Zool. Ser.*, Vol. VII, No. 2, p. 32.

We have not examined specimens of either of the forms mentioned above. But in reviewing the original descriptions of the two species, it became evident that they are very close if not identical. When *jordani* was originally described, the serrations on the teeth were not noticed. Meek and Hildebrand in "The Marine Fishes of Panama," part I, p. 167, state of the single Panama specimen of *jordani* taken by them, "We have compared it with the type of the species with which it appears to agree quite well. The teeth were, however, erroneously described as being smooth, whereas they are distinctly serrate at least on posterior margin near the base. Its relationship therefore is with *G. ocellatus*."

G. ocellatus is a form with widely varying color variations, as can be witnessed by the number of names that have been erected for various specimens, and it is very probable that *jordani* is merely a xanthistic phase.

The four eels listed below are removed from the Bermuda faunal list. We have been unable to find the specimens to which they refer, and in all of the cases there are closely related species that have been found in Bermuda since the publication of the original record.

Leptocephalus sp.

Leptocephalus sp.

Leptocephalus sp., Goode, *Am. Journ. Art. Sci.*, XIV, 1877, p. 293.

This record is ignored as we have been unable to find the specimens and consequently to ascertain whether it represents a larval eel or a conger. The former are abundant off Bermuda, and a new species of Conger, *Conger harringtonensis*, has recently been described from Bermuda by Mowbray.

Ahlia sp. nov.

Ahlia sp. nov.

Ahlia sp. nov., Bean, *Proc. Biol. Soc. Wash.*, XXV, 1912, p. 121.

We have been unable to find the specimen upon which this record is based. The record may possibly refer to either one of two West Indian species of *Myrophis* recently described by Parr and by Breder. These have been taken by us in Bermuda. The genera *Myrophis* and *Ahlia* have been synonymized by Parr.

Gymnothorax (resembling *verrilli*)

Gymnothorax (resembling *verrilli*).

Lycodontis (resembling *verrilli*) Bean, *Proc. Biol. Soc. Wash.*, XXV, 1912, p. 121.

We have not been able to find the specimen referred to in this reference. The closely related *G. vicinus*, first recorded by Goode from Bermuda in 1877, but ignored by Bean in his check-list (1906) has been found by us in Bermuda, and this may be the form mentioned here by Bean.

Muraena sp. nov.

Muraena sp. nov.

Muraena sp. nov., Bean, *Proc. Biol. Soc. Wash.*, XXV, 1912, p. 121.

We have not found the specimen upon which Bean established this record. It may possibly refer to the new species described in 1930 by Mowbray, *Muraena aureus*.

Family SYNODONTIDAE

Synodus foetens (Linnaeus)

Synodus foetens (Linnaeus).

Salmo foetens Linnaeus, *Syst. Nat.*, Ed. XII, 1766, p. 513.

Synodus lacerta (not of Risso) Goode, *Bull. U. S. Nat. Mus.*, V, 1876, p. 68.

Synodus saurus (not of Linnaeus) Barbour, *Bull. Mus. Comp. Zool.*, XLVI, No. 7, 1905, p. 113; Bean, *Field Col. Mus.*, *Zool. Ser.*, VII, No. 2, p. 35.

We have not been able to find the specimens upon which the Bermuda records of the European Lizardfish are based. Some of the recent studies of larger specimens of *foetens* taken along the coast of the United States show dimensions and proportions overlapping those of *saurus*.

Considering the lack of material and the peculiarities of distribution coincident with the admittance of a European shallow-water bottom-fish to the Bermuda fauna, it seems best to think that the specimens were identified as *lacerta* and *saurus* at a time when the variation in *foetens* was not sufficiently well-known.

Family HOLOCENTRIDAE

Holocentrus tortugae Jordan and Thompson

Holocentrus tortugae Jordan and Thompson.

Holocentrus tortugae Jordan and Thompson, *Bull. U. S. Bur. Fisheries*, XXIV, 1904 (1905), p. 236, fig. 1.

Holocentrus puncticulatus Barbour, *Bull. Mus. Comp. Zool., Cambridge*, XLVI, 1905, p. 117.

Holocentrus siccifer (not of Cope) Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 43.

According to the revision of the genus *Holocentrus* given by Parr (1930, p. 34) the specimen assigned to *siccifer* by Bean, must be placed under *tortugae*,—thus removing this problematical species from the Bermudian faunal lists. The dimensions given by Bean for his Bermuda specimen readily fall within the limits of *tortugae* as stated by Parr.

Holocentrus vexillarius (Poey)

Holocentrus vexillarius (Poey).

Holocentrum vexillarium Poey, *Memorias*, II, 1862, p. 158.

Holocentrus brachypterus Poey, *Repertorio*, I, 1866, p. 184; Bean, *Proc. Biol. Soc. Wash.*, XXV, 1912, p. 121.

Field notes made in Bermuda confirm Parr's comments on the relationships of these forms.

Family SYNGNATHIDAE

Corythoichthys ensenadae Silvester

Corythoichthys ensenadae Silvester.

Corythoichthys ensenadae Silvester, *Carn. Inst. Yearbook*, 14, 1915, p. 215; Mowbray, *Copeia*, 104, 1922, p. 19.

It is probable that this species belongs to the genus *Micrognathus* as understood by Duncker. However, the type of the species has disappeared from the collections of Princeton University and we have been unable to trace it, so that the proof of this conjecture must await examination of further material.

Hippocampus punctulatus Guichenot

Hippocampus punctulatus Guichenot.

Hippocampus punctulatus Guichenot, in Ramon de la Sagra, *Hist. Ile. Cuba, Poiss.*, 1853, 174, pl. 5, fig. 2; Bean, *Field Col. Mus., Zool. Ser.*, Vol. VII, No. 2, p. 40.

Hippocampus antiquorum (not of Leach) Goode, *Am. Journ. Sci. Arts*, XIV, Oct. 1877, p. 291.

Hippocampus hippocampus (not of Linnaeus) Bean, *Field Col. Mus., Zool. Ser.*, Vol. VII, No. 2, p. 40.

Hippocampus brunneus Bean, *Proc. Biol. Soc. Wash.*, XIX, 1906, p. 32; Bean, *Field Col. Mus., Zool. Ser.*, Vol. VII, No. 2, p. 39, fig. 1.

Hippocampus hudsonius (not of DeKay) Bean, *Field Col. Mus., Zool. Ser.*, Vol. VII, No. 2, p. 40.

Hippocampus stylifer (not of Jordan and Gilbert) Bean, *Field Col. Mus.*, Vol. VII, 1906, No. 2, p. 40.

? *Hippocampus kinkaidi* Townsend and Barbour, *Bull. N. Y. Zool. Soc.*, No. 23, 1906, p. 304, fig.

We have a considerable number of Bermuda seahorses in our collections and we have also examined all the specimens taken and reported upon by Bean with the exception of the type of *brunneus*. We are of the opinion that all of these Bermuda fish, as explained below,—Bean's *hudsonius*, *punctulatus*, *brunneus* and *stylifer*, are the same, and that the name *punctulatus* Guichenot seems to be the best one to apply to the Bermuda seahorse. *Hippocampus kinkaidi*, described by Townsend and Barbour from Bermuda, is a questionable form. Its status is uncertain and for that reason we place it beneath *punctulatus* with a question. Under any circumstances, the need for a revision of the West Indian seahorses is apparent.

The Bermuda seahorses examined by us divide into two markedly different groups, the first with few spines and very few dermal filaments, the second group markedly spinose and with many filaments. The first group are all males and the second group females. There is considerable variation in depth of body but we have been unable to correlate this with any other factors. As far as coloration, which is admittedly a character of little if any value in this group, is concerned, the preserved specimens give no hint of species differentiation. The color of the living fish in the field is practically any color that happens to surround the fish.

The dorsal fin count in the Bermuda fish varies from 17 to 20, the fin being situated on 2 or $2\frac{1}{2}$ body plus 1 or $\frac{1}{2}$ caudal segments.

Modern authors, such as Jordan and Evermann, Bean 1906, etc., have distinguished *punctulatus* from *hudsonius* mainly on the possession of 17 to 18 rays in the dorsal fin of the former and of 19 in the latter. This has been done despite the fact that Guichenot in the original description of *punctulatus* listed 22 dorsal rays and showed 21 in his figure.

In reviewing the various specimens the following notes were made:—

The large specimen called *hudsonius* by Bean (Field Mus. No. 5064) does not differ from the specimen called *punctulatus* by him, except for the extra dorsal ray. The small fish identified by Bean as *hudsonius* is a female and does not differ from similar specimens identified as *punctulatus*.

The specimen called *stylifer* by Bean possesses 18 dorsal rays and is similar to the others in other ways. The dorsal fin is damaged, but there is no difficulty in tracing the rays with a binocular microscope. As *stylifer* has been reported as a species with 16 rays only in the dorsal fin, and as we believe the fin, because of its damaged condition, to have been wrongly counted, we see no reason for retaining this form as a valid Bermuda species.

Hippocampus brunneus Bean 1906, originally described from Bermuda, has already been included as a nominal color form of *punctulatus* by Fowler (1915, p. 446), and we agree with this decision.

Hippocampus kinkaidi is similar to some of our smaller fish, although its armature is slightly different. We have not examined the type specimen. Considering the variation within the Bermuda seahorses, we are temporarily including it under *punctulatus*.

The following table, showing Bean's specimens and a selection of specimens from the Bermuda Oceanographic Expedition, plus the description of *kinkaidi* will tend to show the similarities of the various fish:

Specimen Number	Sex.	Length, from post. margin of coronet to tip of tail. mm.	Length of Head,* mm.	Snout in head.	Eye in Head.	Post-orbital Head in Head.	Depth in Head.	Body Segments.	Caudal Segments.	Dorsal		
										Fin Rays.	on Body Segments.	on Tail Segments.
<i>brunneus</i> , type, Field Mus. 5494	♂			2.5	6	2.5	1.33	11	35	18	3, -2½ in fig.	1
Bermuda Ocean. Exped. No. 9321.	♂	63	12.7	2.6	5.2	2.3	1.4	12	35	20	2½	1
Bermuda Ocean. Exped. No. 9143.	♂	86	19.2	2.7	5.6	2.3	1.2	12	33	18	2½	½
Field Museum. No. 5064.	♂	88	19.8	2.7	5.6	2.3	1.15	12	34	19	2	1
Field Museum. No. 5495.	♂	126	25	2.5	5.5	2.2	1.1	12	35	18	2	1
<i>kinkaidi</i> , type description.	♀	1.5 in. long	?	2.5	6	2.5	2?	12	?	19	3, -2½ in fig.	1
Bermuda Ocean. Exped. No. 8897	♀	41	11	2.7	5	2.7	1.9	12	35	18	2	1
Bermuda Ocean. Exped. No. 9271.	♀	59	13	2.6	5.2	2.5	1.7	12	34	?	2	1
Field Museum. No. 5066	♀	62	14.3	2.4	5.8	2.4	1.6	12	33	18	2½	1
Field Museum. No. 5065.	♀	64	14.7	2.45	5.5	2.45	1.6	12	35	19	2	1
Bermuda Ocean. Exped. No. 8878.	♀	69	16.5	2.54	5.9	2.1	1.4	12	35	18	3	1
Bermuda Ocean. Exped. No. 8908.	♀	89	20.5	2.2	5.8	2.4	1.2	12	35	19	2	1
Bermuda Ocean. Exped. No. 9094.	♀	98	24	2.3	6	2.3	1.5	12	35	18	2	1

* Measured from snout to gill-opening.

Family FISTULARIIDAE

Fistularia tabacaria Linnaeus

Fistularia tabacaria Linnaeus.

Fistularia tabacaria Linnaeus, *Syst. Nat.*, ed. X, 1758, p. 312.

Fistularia petimba Günther, *Challenger Exped. Rep.*, *Shore Fishes*, p. 68; Meek and Hildebrand, *Field Mus. Nat. Hist.*, *Zool. Ser.*, XV, Part 1, 1923, p. 252.

We consider *petimba* as here stated to be the same as *tabacaria*, following Fowler (Proc. Acad. Nat. Sci. Phila., 1921, p. 439). Bean, although the Bermuda record existed before his 1906 check-list was published, evidently thought the same, as he did not include the species in his report.

Family ATHERINIDAE

Atherina harringtonensis Goode

Atherina harringtonensis Goode.

Atherina harringtonensis Goode, *Am. Journ. Sci. Arts.*, 3rd ser., XIV, No. 82, 1877, p. 297.

Menidia menidia (not of Linnaeus) Barbour, *Bull. Mus. Comp. Zool., Cambridge*, XLVI, 1905, No. 7, p. 116.

We have examined specimens taken in Bermuda by Barbour and labelled *Menidia menidia*, and presumably the specimens upon which the above record is based. These fish are *Atherina harringtonensis*, and this identification is borne out by Barbour's note that they were exceedingly common, which is certainly true of *harringtonensis* in Bermuda. In addition to this fact Barbour did not record *Atherina harringtonensis*. We have seen no specimens of *Menidia* in our four years in Bermuda.

Family MUGILIDAE

Mugil curema Cuvier and Valenciennes

Mugil curema Cuvier and Valenciennes.

Mugil curema Cuvier and Valenciennes, *Hist. Nat. Poiss.*, XI, 1836, p. 64 (87).

Mugil trichodon (not of Poey) Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, 1906, p. 41.

We have examined four of the series of specimens called *M. trichodon* by Bean (Field Mus. Nos. 5210 (2), 5213 and 5215). These fish possess eight anal rays, but in all other characters agree with *Mugil curema*. This combination of characters is present in many of our own fish. However, the Bean specimens labelled *trichodon*, have 36 to 38 scales from the shoulder to the hypural, plus one or two on the base of the caudal fin, while *trichodon*, according to specimens and descriptions, is a large scaled species with from 29 to 31 scales in the lateral line.

These records of *trichodon* therefore, ought to be changed to *Mugil curema*, and the current descriptions of the latter species altered to allow variation of one ray in the anal fin, the descriptions thus reading Anal III, 8 or 9. This variation has been recognized previously by Jacot (1920).

Examination of specimens in collections has shown that too much dependence has been placed in species determination of mullets, upon the anal fin ray count,—almost any mullet in the West Indian fauna possessing 8 anal rays has been placed in *trichodon*.

True *Mugil trichodon* exists in Bermuda as we have specimens in our collections.

Family STROMATEIDAE?

Eucrotus ventralis Bean

Eucrotus ventralis Bean.

Eucrotus ventralis Bean, *Proc. Biol. Soc. Wash.*, XXV, 1912, p. 123.

The type of this pelagic species, recorded as being in the Bermuda Museum of Natural History, is now in the collection of the American Museum of Natural History, New York City.

Family CARANGIDAE

Decapterus punctatus (Agassiz)

Decapterus punctatus (Agassiz).

Caranx punctatus Agassiz, in Spix, *Pisc. Brasil*, 1829, p. 108, pl. 56a.

Decapterus punctatus Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 48.

Decapterus scombrinus (not of Valenciennes) Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 48.

We consider the two specimens referred to by Bean as *D. scombrinus* to be variants of *punctatus*. Bean, in his own account, also questioned these fish, as he says,—“These two examples are referred to *D. scombrinus*, although it is doubtful if this species be distinct from *punctatus*.”

Decapterus macarellus (Cuvier and Valenciennes)

Decapterus macarellus (Cuvier and Valenciennes).

Caranx macarellus Cuvier and Valenciennes, *Hist. Nat. Poiss.*, IX, 1833, p. 33 (40).

Decapterus macarellus, Parr, *Bull. Bingham Oceano. Coll.*, Vol. III, Art. 4, 1930, p. 46.

Decapterus sanctae-helenae (not of Cuvier and Valenciennes) Bean, *Proc. Biol. Soc. Wash.*, XXV, 1912, p. 121.

We follow Parr in referring the western Atlantic specimens of *sanctae-helenae* to *macarellus*.

Caranx crysos (Mitchill)

Caranx crysos (Mitchill).

Scomber crysos Mitchill, *Trans. Lit. Phil. Soc. N. Y.*, I, 1815, p. 424.

Caranx caballus, Günther, *Rep. Shore Fish Challenger Expedition*, 1880, 10; Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 48.

We include the Challenger Bermuda record of *caballus* in the synonymy of *crysos*. The specimen upon which it is based cannot be found in the British Museum.

Family SERIOLIDAE

Seriola dumerili (Risso)

Seriola dumerili (Risso).

Caranx dumerili Risso, *Ichthy. Nice*, 1810, 175, pl. 6, fig. 20.

Seriola lalandi Cuvier and Valenciennes, *Hist. Nat. Poiss.*, IX, 1833, 155 (208); Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 48.

Following Meek and Hildebrand (Marine Fishes of Panama, p. 397) we consider *lalandi* as a synonym of *dumerili*. However, the status of the fishes of the genera *Seriola* and *Zonichthys* is quite confusing, and the entire group is in urgent need of careful study.

Family APOGONIDAE

Apogon sellicauda Evermann and Marsh

Apogon sellicauda Evermann and Marsh 1900.

Apogon sellicauda Evermann and Marsh, *Bull. U. S. Fish. Comm.*, XX, 1900, p. 143, fig. 40.

Apogon imberbis (not of Linnaeus), Goode, *Am. Journ. Sci. Arts*, XIV, Oct. 1877, p. 292; Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 51.

Two Bermuda specimens from the U. S. National Museum collection (Nos. 21,957 and 22,172), one from J. M. Jones and the other from the Mus. West. Univ., have been examined by us. They are labelled *Apogon imberbis*, and presumably are the specimens upon which Goode's identification is based. Goode had considerable Bermuda material from J. M. Jones, and the Jones' specimen bears a number post-dating the second fish, so the probability is that these are the two fish which Dr. Goode identified. Both are deep brown and straw color, having lost all trace of pattern and color. The smaller specimen has been dried at some time and is considerably shrivelled.

The larger of the two fish, 70 mm. standard length (No. 21,957), we identify as *Apogon sellicauda* Evermann and Marsh, of which species we have numerous Bermuda examples.

Until the issuance of Evermann and Marsh's "Fishes of Porto Rico," all of the known West Indian species of *Apogon* possessed relatively large scales, 23 to 26 pores in the lateral line. Probably because of this fact, Dr. Goode considered that the fish mentioned above with 29 lateral line pores was closer to *imberbis*, the Mediterranean Cardinal-fish with 28 to 30 lateral line scales, than any form then known. This was quite consistent with his views as to the European origin of other Bermuda fishes.

However, Evermann and Marsh in their description of *sellicauda* recognized the existence of a small-scaled West Indian form, mentioning 27 scales in the lateral line in the original account of the species. Material subsequently taken shows that the variation in the scale count is from 27 to 29,—counts which include Goode's specimen.

Apogon sellicauda has been synonymized with *A. maculatus* by Metzelaar (1919, p. 59) on the basis of color, and in this he has been followed by Breder (1927, p. 38). However, it seems better to keep the two forms separate until it has been shown that the difference in scale count is of no specific value. As far as color is concerned, while the two forms are exceedingly close, it has not been demonstrated that *maculatus* possesses the conspicuous and large black saddle on the caudal peduncle, nor the coloration of the head and eye of *sellicauda*.

The smaller of the two U. S. National Museum specimens (No. 22,172) belongs to the large-scaled group of West Indian Apogons (approximately 23 pores in the lateral line). While it is definitely not *A. imberbis*, it is in such poor condition that we hesitate giving it a definite name.

Apogon pigmentarius (Poey)

Apogon pigmentarius (Poey).

Monoprion pigmentarius Poey, *Memorias*, II, 1861, p. 123.

This species exists in Bermuda as we have found specimens. The specimens recorded under this name by Bean (*Field Col. Mus.*, Zool. Ser., Vol. VII, No. 2, p. 50) have been examined by us. These fish are *Astrapogon stellatus* (Cope), as can be verified by reading Dr. Bean's notes.

Astrapogon stellatus (Cope)

Astrapogon stellatus (Cope).

Apogonichthys stellatus Cope, *Trans. Amer. Phil. Soc.*, XIII, 1869, p. 400.

Astrapogon stellatus Fowler, *Proc. Acad. Nat. Sci., Phila.*, LXIII, 1906, p. 527.

Apogon pigmentarius (not of Poey) Bean, *Field Col. Mus.*, Zool. Ser., VII, No. 2, p. 50.

This species is a common Bermuda form. Bean's fish listed as *Apogon pigmentarius*, belong under this species as stated above,—his specimens possessing the elongate pelvic fins characteristic of this species.

Astrapogon stellatus with its exceptionally long pelvic fins is conspicuously different from its relatives in the genus *Apogonichthys*, and for that reason we prefer to use Fowler's generic name of *Astrapogon*. The following key can be used to differentiate the West Indian genera *Apogon*, *Apogonichthys* and *Astrapogon*:—

- A. Caudal moderately forked *Apogon*
- AA. Caudal rounded.
 - B. Pelvic fins short, the tips of the fins not or barely reaching to the origin of the anal fin *Apogonichthys*
 - BB. Pelvic fins long, their tips reaching far beyond the origin of the anal fin *Astrapogon*

Family SERRANIDAE

Anthias louisii Bean

Anthias louisii Bean.

Anthias louisii Bean, *Proc. Biol. Soc. Wash.*, XXV, 1912, p. 124.

The type of this species, recorded as being in the Bermuda Museum of Natural History, is now in the collection of the American Museum of Natural History, New York City.

Family LUTIANIDAE

Lutianus buccanella (Cuvier and Valenciennes)

Lutianus buccanella (Cuvier and Valenciennes).

Mesoprion buccanella Cuvier and Valenciennes, *Hist. Nat. Poiss.*, II, 1828, 344 (455).

Lutianus aya (not of Bloch) Goode, *Bull. U. S. Nat. Mus.*, V, 1876, p. 55; Goode, *Am. Journ. Sci. Arts*, XIV, Oct. 1877, p. 292; Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 57.

Goode's record of *aya* must belong to this species as he reports a black spot at the base of the pectoral fin, and *buccanella* is the only red Bermudian snapper to which this characteristic could refer. Ginsburg (1930, p. 276) in his paper on red snappers, is also in agreement with this statement. As far as the presence of *aya* in Bermuda is concerned, Bean (1906, p. 57) states that "There is no evidence that *aya* occurs in Bermuda." Our experiences during four years in Bermuda causes us to agree with this statement.

Mowbray (Copeia, No. 108, 1922, p. 49) records *aya* from Bermuda. But considering the status of our present knowledge of the various red West Indian and Bermuda snappers, it seems best to question this record until more detailed material is produced.

Goode's account of *aya* is an extremely interesting one as he confused three separate species and gave them all the name of a fish that did not live in Bermuda. Thus his red snapper, *aya*, refers to *buccanella*, his common name of Yelting refers to the Yellow-tail (*Ocyurus chrysurus*), and the name of Glass-eyed Snapper to *Etelis oculatus*.

Family HAEMULIDAE

Bathystoma aurolineatum (Cuvier and Valenciennes)

Bathystoma aurolineatum (Cuvier and Valenciennes).

Haemulon aurolineatum Cuvier and Valenciennes, *Hist. Nat. Poiss.*, V, 1830, p. 176 (237).

Bathystoma aurolineatum, Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 58.

Bathystoma rimator (not of Jordan and Swain) Barbour, *Bull. Mus. Comp. Zool.* XLVI, No. 7, 1905, p. 123; Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 58.

We have examined the specimens called *rimator* by Barbour (M. C. Z. 32843). The depth of the body in these fish averages 3.2 to 3.45.

As we understand the differences, judging from the literature, between *rimator* and *aurolineatum*, the former species is a deeper form, the depth being from 2.75 to 3 in the length, while in *aurolineatum* the same measurement is from 3.1 to 3.7. This, in addition to the verification of other characters, would make the specimens mentioned above *aurolineatum*, and we so consider them.

Bathystoma aurolineatum is common in Bermuda, and we have had dozens of specimens, all of which have agreed with our ideas as to the limits of the species. We have never found specimens of *rimator*.

Under any circumstances the genus *Bathystoma* is in urgent need of careful study.

Family SPARIDAE

Diplodus argenteus (Cuvier and Valenciennes)

Diplodus argenteus (Cuvier and Valenciennes).

Sargus argenteus Cuvier and Valenciennes, *Hist. Nat. Poiss.*, VI, 1833, 44 (60).

Sargus variegatus (not of Lacepede) Goode, *Bull. U. S. Nat. Mus.*, 5, 1876, p. 52 (account confused with that of *Pimelepterus bosci*).

Diplodus holbrooki (not of Bean) Fowler, *Proc. Acad. Nat. Sci. Phila.*, LXXXI, 1930, 644.

The common Bream of Bermuda is considered by us as *argenteus*, the American form of the genus, rather than as *Sargus sargus* or *S. variegatus* as Dr. Goode recorded it. Dr. Bean (1906) evidently had the same opinion as he ignored the name of the European form in his check-list of Bermuda fishes.

The specimen identified by Fowler as *Diplodus holbrooki* from Bermuda, has been examined and compared with Bermuda Breams. We find no reason for considering it as otherwise than *argenteus*. The specimen is damaged so that exact scale counts are somewhat difficult, but it definitely possesses the smaller scales of *argenteus* as opposed to those of *holbrooki*.

Family GERRIDAE

Eucinostomus californiensis (Gill)

Eucinostomus californiensis (Gill).

Diapterus californiensis Gill, *Proc. Acad. Nat. Sci. Phila.*, XIV, 1862, p. 245.

Eucinostomus pseudo-gula Poey, *Enumeratio*, 1875, p. 53, pl. 1.

Eucinostomus pseudogula Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 60.

Eucinostomus harengulus Goode and Bean, *Proc. U. S. Nat. Mus.*, II, 1879, p. 132; Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 59.

We follow Meek and Hildebrand (Marine Fishes of Panama, pp. 584-586) in placing *pseudogula* and *harengulus* under *californiensis*. Nichols (1929, p. 183) does not agree with this, and it is possible that further study will show that the Atlantic and Pacific forms ought to be separated.

It is of interest to note that our Bermuda specimens of *Eucinostomus gula* and *californiensis* are quite uniform in proportions and counts. The condition of overlapping of one species toward the other, stated by Meek and Hildebrand (582-584) and by Beebe and Tee-Van (1928, p. 167) and found respectively in Panama and Haiti, does not occur in the Bermudian specimens seen by us.

Family CHAETODONTIDAE

Chaetodon ocellatus Bloch*Chaetodon ocellatus* Bloch.

Chaetodon ocellatus Bloch, *Naturgesch. Aust. Fische*, III, pl. 211, 1787, 105 (Also from the East Indies); Barbour, *Bull. Mus. Comp. Zool.*, XLVI, No. 7, p. 127.

Chaetodon ataeiniatus (not of Poey), Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 73.

We have examined the specimens listed as *ataeniatus* by Bean, and we can see no reason why they should not be considered as *ocellatus*.

Angelichthys bermudensis (Goode)*Angelichthys bermudensis* (Goode).

Holacanthus ciliaris var. *Bermudensis* Goode, *Bull. U. S. Nat. Mus.*, 5, 1876, p. 43.

Angelichthys isabelitae Jordan and Rutter, in Jord. and Evermann, *Fishes N. and Middle America*, 1898, p. 1685.

Angelichthys ciliaris (not of Linnaeus) Barbour, *Bull. Mus. Comp. Zool.*, XLVI, No. 7, 1905, p. 127; Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, 1906, p. 74.

Angelichthys formosus Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, 1906, p. 74.

Goode in 1876 in his "Catalogue of the Fishes of the Bermudas," gives a color description of a specimen of the common angelfish of Bermuda, listing it under *Holacanthus ciliaris* (Linne) Lacépède. After the color description he gives the following notes,—“My specimens, some twelve in number, differ from all descriptions in the absence of the spot of brown, encircled with blue, on the nape. I have examined numerous West Indian specimens and find it universally present. Should this character prove constant, the Bermuda Angel-fish may be considered a geographical variety, *Holacanthus ciliaris*, var. *Bermudensis*.”

Goode's descriptions and notes agree with the species currently known as *Angelichthys isabelitae*, which is the common angelfish of Bermuda, and it is evident that the latter name must be replaced by *bermudensis* Goode.

The specimens listed by Barbour, and those listed by Bean under *ciliaris* and *formosus* have been examined by us. They are all specimens of *bermudensis*, the specimen listed under *formosus* being a young fish.

Family POMACENTRIDAE

Demoisellea marginatus (Castelnau)*Demoisellea marginatus* (Castelnau).

Heliases marginatus Castelnau, *Anim. Amer. Sud., Poiss.*, V, 1830, 370 (394).

Furcaria cyanea (not of Poey) Barbour, *Bull. Mus. Comp. Zool., Cambr.*, XLVI, No. 7, p. 124; Bean, *Field Col. Mus., Zool. Ser.*, VII, 2, p. 63.

The Bermuda specimen recorded by Barbour as *Furcaria cyanea* has been examined and compared with the types of *cyanea* which are preserved in the Museum of Comparative Zoology. It differs from that species in possessing the low type of anal fin characteristic of *marginatus* and *multilineatus*,—differences pointed out by Beebe and Tee-Van (Zoologica, X, 1, pp. 192-194). In its other characters it also agrees with *marginatus*.

The label in the bottle containing the fish, states, "Honda ? Bermuda, Captain Hamilton 1864." We do not know where Honda is located, and since 1864 there is no additional record of the fish in Bermuda. It is possible that it may have been recorded from Bermuda by error.

Whitley (Rec. Austr. Mus., XVI, No. 6, p. 295) has pointed out that *Furcaria* Poey 1860 is preoccupied by *Furcaria* Lesson 1838, and proposes *Demoisellea* in place of Poey's name. This will cause the Bermuda fish of this group to stand as follows: *Demoisellea cyanea* (Poey), *Demoisellea marginatus* (Castelnau), and *Heliases bermudae* (Nichols).

Family CORIDAE

Iridio radiata (Linnaeus)

Iridio radiata (Linnaeus).

Labrus radiatus Linnaeus, *Syst. Nat.*, Ed. X, 1758, p. 65, fig. 6.

Iridio radiatus Bean, *Field Col. Mus.*, *Zool. Ser.*, VII, No. 2, p. 68;

Mowbray, *Fauna Bermudensis*, No. 1, 1931, 6th unnumbered page.

Iridio elegans Bean, *Proc. Biol. Soc. Wash.*, XIX, 1906, p. 30; Bean, *Field Col. Mus.*, *Zool. Ser.*, VII, No. 2, 1906, p. 65, fig. 6.

Iridio elegans represents one of the immature stages of this species, a fact that has already been noted by Mowbray, and verified by us in a number of individuals.

The inclusion of *Iridio bivittatus* (Bloch) in the synonymy of this species is unwarranted. Both forms are quite distinct and the growth stages of *bivittatus* have been admirably demonstrated by Mowbray (*Fauna Bermudensis*, 6th unnumbered page).

Iridio maculipinna (Müller and Troschel)

Iridio maculipinna (Müller and Troschel).

Julis maculipinna, Müller and Troschel, in Schomburgk, *Hist. Barbados*, 1848, p. 674.

Iridio meyeri Bean, *Proc. Biol. Soc. Wash.*, XIX, 1906, p. 29; Bean, *Field Col. Mus.*, *Zool. Ser.*, VII, No. 2, 1906, p. 65, fig. 7.

Iridio microstomus Bean, *Proc. Biol. Soc. Wash.*, XIX, 1906, p. 30; Bean, *Field Col. Mus.*, *Zool. Ser.*, VII, No. 2, p. 67, fig. 8.

Iridio maculipinna Bean, *Proc. Biol. Soc. Wash.*, XXV, 1912, p. 122.

Iridio frenatus Nichols, *Proc. Biol. Soc. Wash.*, XXXIII, 1920, p. 61.

All of the nominal forms mentioned above have been recorded at one time or another from Bermuda, and for a number of years our records of this species were listed under *meyeri*, which is locally quite common.

Recent comparison of these Bermuda specimens called *meyeri* with the older descriptions of *maculipinna* leave no doubt that the two are the same. The species is variable in coloration, but in all of its phases except those of the very young, it possesses dark transverse cross-bars on top of the head, plus a dark spot in the dorsal fin. The bands on top of the head persist through all of the older descriptions of *maculipinna* and they are described either as dark bands, or the interspaces are denoted as pale bands, the divergence being due to discoloration due to preservation.

We have had specimens of the nominal *microstomus* in the field and we consider it as the young of this species, although it lacks the characteristic head markings.

The type of *Iridio frenatus* has also been examined by us and it is a rather dark example of *maculipinna*.

Iridio garnoti (Cuvier and Valenciennes)

Iridio garnoti (Cuvier and Valenciennes).

Julis garnoti Cuvier and Valenciennes, *Hist. Nat. Poiss.*, XIII, 1839, p. 285 (390).

Iridio decoratus Bean, *Proc. Biol. Soc. Wash.*, XIX, 1906, p. 29; Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 64, fig. 5.

Our studies in the field show quite conclusively that *decoratus* is but a nominal young form of *garnoti*.

Thalassoma bifasciatum (Bloch)

Thalassoma bifasciatum (Bloch).

Labrus bifasciatus Bloch, *Naturges. Ausl. Fische*, V, 1791, p. 131.

Julis nitida Günther, *Cat. Fish Brit. Mus.*, IV, 1862, p. 190.

Julis nitidissima Goode, *Am. Journ. Sci. Arts*, XIV, Oct. 1877, p. 293.

Chlorichthys bifasciatus Bean, *Field Col. Mus., Zool. Ser.*, Vol. VII, No. 2, 1906, p. 68.

Chlorichthys nitidus Bean, *Field Col. Mus., Zool. Ser.*, Vol. VII, No. 2, 1906, p. 68.

Bermudichthys subfurcatus Nichols, *Proc. Biol. Soc. Wash.*, XXXIII, 1920, p. 62.

Thalassoma bifasciatus Breder, *Bull. Bingham Ocean. Coll.*, Vol. 1, No. 1, 1927, p. 60-63.

Thalassoma bifasciatum Beebe and Tee-Van, *Zoologica*, Vol. X, No. 1, 1928, pp. 205-206; Tee-Van, *Bull. N. Y. Zool. Soc.*, XXXV, No. 2, 1932, pp. 43-47.

Thalassoma nitida Beebe and Tee-Van, *Zoologica*, Vol. X, No. 1, pp. 205-206.

Iridio cyanocephalus (not of Bloch) Barbour, *Bull. Mus. Comp. Zool.*, XLVI, No. 7, 1905, p. 125.

The synonymy of this species, as far as *T. bifasciatum* and *T. nitida* is concerned, has been proven quite conclusively by Breder (1927), Beebe and Tee-Van (1928) and Tee-Van (1932) (l. c.).

The type of *Bermudichthys subfurcatus* in the American Museum of Natural History, which we have examined, is a damaged specimen of this species. The apparent differences in fin ray counts do not exist when the specimen is examined under a binocular microscope, and in teeth and color it does not differ from similar dark specimens from Bermuda. We consider the tail as lunate, not forked.

A Bermuda specimen in the Barbour collection at the Museum of Comparative Zoology labelled *Iridio cyanocephalus*, and presumably that upon which the Barbour record is based, is an exceedingly dark specimen of the Blue-head, *Thalassoma bifasciatum*. Barbour used the common name Blue-head for his specimen, so that the change in record is also supported by that evidence. We have never found true *cyanocephalus* at Bermuda, so that the name can be expunged from Bermuda faunal lists.

Family SPARISOMIDAE

Cryptotomus roseus Cope

Cryptotomus roseus Cope.

Cryptotomus roseus Cope, *Trans. Amer. Phil. Soc.*, XIV, 1871, p. 462.

Cryptotomus crassiceps Bean, *Proc. Biol. Soc. Wash.*, XIX, 1906, p. 32; Bean, *Field Col. Mus., Zool. Ser.*, VII, 1906, No. 2, p. 70.

We follow and agree with Fowler (1915, p. 257) in synonymizing the nominal color form *crassiceps* with *roseus*. Bermuda specimens taken by us are in accord with this merging.

Sparisoma radians (Cuvier and Valenciennes)

Sparisoma radians (Cuvier and Valenciennes).

Scarus radians Cuvier and Valenciennes, *Hist. Nat. Poiss.*, XIV, 1839, p. 153 (206).

Sparisoma radians Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 72.

Scarus hoplomystax Cope, *Trans. Amer. Phil. Soc.*, XIV, 1871, p. 462.

Sparisoma hoplomystax Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 72.

Sparisoma xystrodon Jordan and Swain, *Proc. U. S. Nat. Mus.*, VII, 1884, p. 99; Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 73.

We follow Meek and Hildebrand in synonymizing the above species. Bermuda specimens are in agreement with this merging.

Family GOBIIDAE

Rhinogobius mowbrayi Bean

Rhinogobius mowbrayi Bean.

Rhinogobius mowbrayi Bean, *Field Col. Mus., Zool. Ser.*, VII, 1906, No. 2, p. 81, fig. 12.

Leptophilypnus crocodilus Beebe and Tee-Van, *Zoologica*, Vol. X. 1928, No. 1, p. 219, fig.

The type of *Leptophilypnus crocodilus* Beebe and Tee-Van, has been compared with Bermuda specimens of *Rhinogobius mowbrayi*. They are undoubtedly the same, and the misidentification arose mainly because of the damaged ventral fins of the Haitian specimen, which produced an eleotrid-like appearance.

Lophogobius glaucofraenum (Gill)

Lophogobius glaucofraenum (Gill).

Coryphopterus glaucofraenum Gill, *Proc. Acad. Nat. Sci. Phila.*, 1863, p. 263 (Reported from the Coast of Washington,—the latter statement evidently an error).

Rhinogobius glaucofraenum Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, p. 81.

Gobius translucens Nichols, *Bull. Amer. Mus. Nat. Hist.*, XXXIV, 1915, p. 145, fig. 2; Nichols, *Prcc. Biol. Soc. Wash.*, XXXIII, 1920, p. 63.

Lophogobius pallidus Parr, *Bull. Bingham Oceano. Coll.*, Vol. III, Art. 4, 1930, p. 122, fig. 33; Beebe and Tee-Van, *Zoologica*, Vol. XIII, No. 5, 1932, p. 120.

In recently examining specimens that had been assigned in the field at Bermuda to *glaucofraenum* and *translucens* a well-marked dermal crest was noticed. The crest is similar to that described and illustrated by Parr in his description of *Lophogobius pallidus*. These well-preserved Bermuda fish have been compared with the type of *translucens* with which they agree in form, pattern and in all other characters except that of the dorsal crest. The type of *translucens*, however, is somewhat shrivelled as far as the top of the head is concerned, and while the crest does not show, we believe that this is because of methods of preservation. It does, however, possess the conspicuous pigment spots that appear on the dermal ridges of the Bermuda specimens, and there is no doubt in our minds but that the type of *translucens* and the Bermuda specimens are the same.

Judging from Bermuda specimens there is no reason for maintaining *translucens* separate from *glaucofraenum*, as the difference in scale counts and color cause them to overlap. We have not been able to examine the types of *glaucofraenum*, but we have no compunction in synonymizing the two forms.

The specimens recorded from Bermuda by Beebe and Tee-Van as *Lophogobius pallidus* are also the same as the specimens mentioned above. They agree so well with Parr's original description that we consider *pallidus* as a synonym of *glaucofraenum*.

Parr, in his description of *pallidus*, grouped it with *L. cyprinoides* in the genus *Lophogobius*, and in our present state of knowledge of West Indian gobies, such a procedure seems to be quite proper in the present case. It must be noticed, however, that the crests are quite different in the two species,—the crest of *cyprinoides* being rather high, thin and membranous in the living fish, incapable of supporting itself when the fish is out of water, while the crest of *glaucofraenum* is low, rather wide, relatively ridge-like and by no means membranous. Whether these distinctions can be correlated with others to establish a different generic status for the two forms is a future problem.

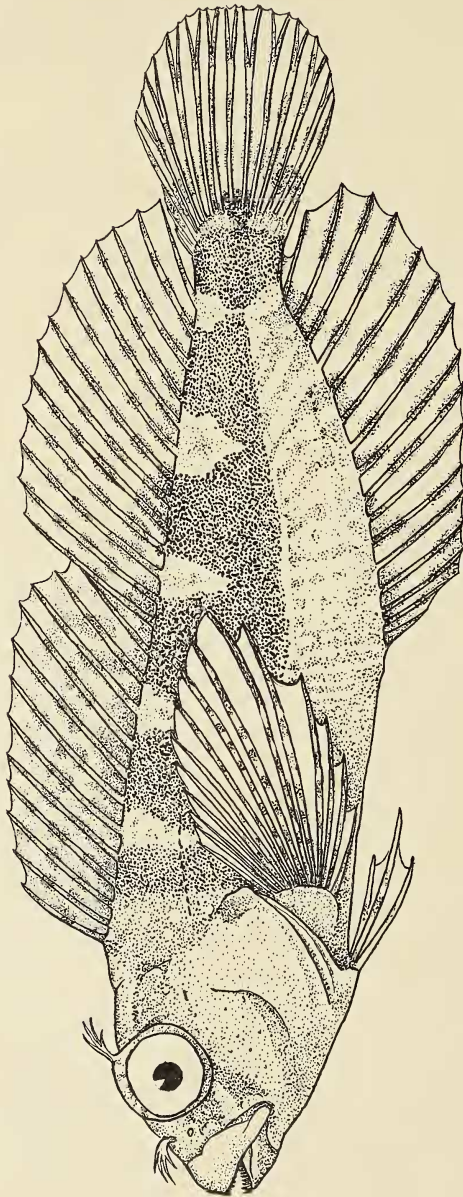


Fig. 38. *Hupleurochilus bermudensis* sp. nov.

Family CALLIONYMIDAE

Callionymus bermударum Barbour

Callionymus bermударum Barbour.

Callionymus bermударum Barbour, *Bull. Mus. Comp. Zool.*, XLVI, No. 7, 1905, p. 129; Bean, *Field Col. Mus.*, *Zool. Ser.*, VII, No. 2, p. 81.

Callionymus dubiosus Parr, *Bull. Bingham Oceano. Coll.*, III, 1930, No. 4, p. 130, fig. 36; Beebe and Tee-Van, *Zoologica*, XIII, No. 5, 1932, p. 120.

During the various years at Nonsuch Island a number of examples of *dubiosus*, recently described by Parr from the Bahamas, were obtained. One of these examples has been compared by Parr with the type, from which it differed very slightly.

In 1932 the junior author examined the types of *bermударum* in the Museum of Comparative Zoology at Cambridge as well as our Bermuda material. Although our materials representing *dubiosus* have not been directly compared with the types of *bermударum*, it is quite certain that the two forms are identical.

Parr was justified in erecting a new species for his material as the original description of *bermударum* mentions only three dorsal spines, while Parr's material had four. In a re-examination of the type of *dubiosus* a fifth rudimentary spine was found,—this spine being well developed in the Bermuda fish. However, examination of the types of *bermударum* show that there are 5 and possibly 6 spines. The spinous dorsal fins in this type material are in poor condition, and have evidently been damaged, making accurate counting difficult, but there are certainly more than three spines in each of the fishes examined. The discrepancy between the specimens and the description was noted before, as there is a label in the bottle containing the types, presumably written by Dr. Garman, stating "D 7 + 7, A 5."

In color, opercular spines, lateral body keels, and other characters not mentioned in the description of *bermударum*, the two forms are alike, and *dubiosus* ought to be placed in the synonymy of *bermударum*.

Family BLENNIDAE

Hypleurochilus Gill 1861**Hypleurochilus bermudensis** sp. nov.

Type: No. 33070, Museum of Comparative Zoology, Cambridge (Field No. 440), Marshall Island, Bermuda, August 8th, 1918. Standard length 40 mm.

FIELD CHARACTERS: Small, short-headed, rather compressed, scaleless fish with small pelvic fins of three rays each; gill-openings confined to the sides only, the membrane fully attached to the isthmus below. A short multifid tentacle above the eye and a multifid one on the anterior nostril. Color brownish to yellow-buff, heavily barred above and mottled with dark brown. Vertical and paired fins with small brown spots on the rays.

MEASUREMENTS AND COUNTS: Total length 49 mm.; standard length 40 mm.; depth 9.8 (4 in length); width of body 6.8; head 12.5 (3.2 in length); eye

3.5 (3.6 in head); interorbital space 1.5 (8.2 in head); snout 4.2 (3 in head); maxillary 4.3 (2.9 in head); snout to dorsal fin 10.8 (3.7 in length); snout to anus 24 (1.66 in length); depth of caudal peduncle 3.7 (3.4 in head); distance between openings of gill-slits ventrally 4.8 mm.; dorsal fin XII, 13; anal fin I, 15; pectoral rays 15; pelvic rays 3; pectoral length 12.3 mm.; pelvic length 8.6 mm.; scales absent.

Body compressed, especially posteriorly, deepest just behind the pectoral fins. Anterior profile with a slight downward curve immediately in front of the dorsal, then straight and slightly downward to the orbit. Profile from eye to snout straight, oblique, and at a considerable angle from the dorsal profile.

Skin naked. A four-fingered dermal tentacle over the eye slightly posterior to the eye's vertical axis, the length of the tentacle slightly more than half the height of the eye. No cirri on the nape. A multifid cirri on the anterior nostril.

Lateral line prominent, rather high up on the side, short and present on the anterior sides only, ending under the 9th dorsal spine on the right side and under the 11th dorsal spine on the left side.

Head somewhat deeper than wide; opercles smooth, the opercle ending posteriorly in a deep bay, the membrane of the opercle continued posteriorly into an obtuse flap. Gill-membranes united to each other and completely attached to the isthmus below, the gill-openings thus restricted to the sides.

Snout obtuse, its length slightly greater than the diameter of the eye.

Eye not quite round, its longest diameter oblique, medium in size (3.5 in head); its upper edge entering the dorsal profile. Interorbital space narrow (8.2 in the head).

Anterior nostril with a multifid tentacle on its posterior aspect. Posterior nostril close to the eye, without appendages. Mouth, rather small; the lips, especially the upper, rather full; maxillary extending to slightly beyond the anterior margin of the pupil.

Teeth firmly set on the jaws, their tips obtusely pointed; in a single row in each jaw, each tooth considerably curved and with a cusp on its inner basal aspect. The teeth of the upper jaw are followed posteriorly by a short space and then a single canine, in shape and size much like the remaining jaw teeth.

Dorsal fin continuous, the spines shorter than the rays, the base of the spinous portion slightly longer than that of the soft dorsal. The 1st spine is 4.2 mm. high; the fin then slowly ascends to the 5th to the 9th spines which are all 5.8 mm. high, and then descends to the 12th which is 3.5 mm. The rays are abruptly higher, the first ray being 6.5 mm. high, the 5th to the 7th being 7.8 mm. while the 13th is 3.6 mm.

The anal fin is lower than the dorsal, the highest rays being 11th to 13th, which are 6 mm. Tips of the anal rays curved backward.

Pectoral fins extending to the vertical of the first dorsal ray, the 5th ray from the bottom longest, the lower rays much thicker and heavier than the others. Base of the pectoral nearly vertical.

Pelvic fins inserted anterior to the pectorals and immediately in back of the attachment of the gill membranes to the isthmus. Third ray considerably shorter than the anterior two, the second of which is the longer.

Color (Alcoholic specimen): General color of head brownish, that of the body yellowish-buff, becoming lighter posteriorly. Body with six large dark brown blotches on the upper two-thirds of the sides, broadest in the middle of the sides and in some cases connected with each other. Remainder of body freckled with small spots of lighter brown. Vertical and paired fins with small brown spots on the rays, forming in some cases irregular bands, most prominent on the anal, spinous dorsal and caudal fins.

Discussion: This species differs from *H. geminatus*, the only other described Atlantic species of the genus, in size of head, anal fin count, presence of canines in the upper jaw only, emarginate dorsal fin, and in color.

Family ANTENNARIIDAE

Antennarius radiosus Garman

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Antennarius radiosus Garman, *Bull. Lab. Nat. Hist. Iowa Univ.*, 1896, p. 85, pl. 1; Bean, *Field Col. Mus., Zool. Ser.*, VII, No. 2, 1906, p. 89.

We have examined the specimen (U. S. Nat. Mus. No. 50,000) upon which Bean based the Bermuda record. It agrees well in general form and fairly well in color with the original description of *radiosus*, but differs in possessing a short 1st dorsal spine,—the spine itself, excluding the filaments, being of about the same length as the second dorsal spine. Unfortunately, both of these spines were broken off in our examination of the specimen.

Considering the sparseness of material and our lack of knowledge of variation within the group, it seems best to retain the identification given by Bean to this specimen, and to point out that it is by no means typical.

In the "Field Book of Shore Fishes of Bermuda" mentioned in the introduction to this paper, only the strictly shore-living species and the commoner pelagic forms such as flyingfish and dolphins are treated. The following species, already reported in the ichthyological literature of Bermuda will be included in future reports on the Deep-sea Fishes of Bermuda:

Amphioxides pelagicus Günther.

Etmopterus pusillus Lowe.

Lampanyctus crocodilus (Risso).

Coelorhynchus occa (Goode and Bean).

Regalecus glesne Ascanius.

Brama raii (Bloch).

Lirus maculatus Günther. (Reported as *Centrolophus* sp. by Goode).

Psenes pellucidus Lütken.

Eucrotus ventralis Bean.

Macrorhamphosus scolopax (Linnaeus).

Mola mola (Linnaeus).

Ranzania truncata (Retzius).

After this paper was in page proof, we received an excerpt of Dr. W. H. Longley's paper, "Preparation of a monograph on The Tortugas fishes" (Carnegie Institute Year Book, No. 31, 1931-1932, pages 299-300). It is a matter for congratulation that in the difficult field of synonymy of the West Indian fish fauna, the majority of our conclusions, arrived at independently, are identical with those of Dr. Longley.